No. 17-1072

United States Court of Appeals for the Federal Circuit

CF CRESPE LLC,

Appellant,

v.

SILICON LABORATORIES INC.,

Appellee.

Appeal from the Patent Trial and Appeal Board
in *Inter Partes* Review No. IPR2015-00615

BRIEF OF APPELLANT CF CRESPE LLC

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Date: February 13, 2017

CERTIFICATE OF INTEREST

Pursuant to Federal Circuit Rules 28(a)(1) and 47.4(a), counsel for Appellant, CF CRESP LLC, certifies the following:

1. The full name of every party represented by me is CF CRESPE LLC.

2. The name of the real party in interest represented by me is CF CRESPE LLC.

3. The name of the parent corporation and any publically held companies that own 10% or more of stock in CF CRESPE LLC is CF DB EZ LLC.

4. The names of all law firms and the partners and associates who appeared for Appellant in the proceedings below are: Michael R. Fleming, Robert W. Hahl and Robert Mihail for Neifeld IP Law, PC, Irell & Manella LLP, Benjamin Haber for Irell & Manella LLP, Mihai Murgulescu and Andrei Popovici and William J. Seymour for Lando & Anastasi, LLP. The name of all law firms and the partners and associates who are expected to appear for CF CRESPE LLC in this Court are: Craig R. Smith and Eric P. Carnevale for Lando & Anastasi, LLP.

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STATEMENT OF RELATED CASES

Pursuant to Federal Circuit Rule 47.5, Appellant states:

A. There have been no other appeals from this *inter partes* review before this or any other court.

B. Appellant believes the following cases may be directly affected by this Court's decision in this appeal:

   a. *Cresta Technology Corporation v. Silicon Laboratories, Inc.*, No. 1:14-cv-00078 (D. Del. Filed Jan. 21, 2014);

   b. *Cresta Technology Corporation v. MaxLinear, Inc.*, No. 1:14-cv-00079 (D. Del. Filed Jan. 21, 2014).

JURISDICTIONAL STATEMENT

This is an appeal from the Final Written Decision in *inter partes* review no. IPR2015-00615 (the "'615 IPR") concerning certain claims of U.S. Patent No. 7,075,585 (the "'585 Patent"). The decision appealed from is final and thus appealable pursuant to 28 U.S.C. § 1295(a)(4)(A) and 35 U.S.C. § 319.

On August 11, 2016 a panel of the Patent Trial and Appeal Board issued a Final Written Decision in the'615 IPR (the "Decision"). Appx2962-3011. The Decision invalidated claims 11-15 and 20 of the '585 Patent. On December 18, 2015, patent owner CF CRESPE LLC ("CF CRESPE") timely filed its notice of appeal of the Decision with the United States Patent and Trademark Office, and simultaneously served copies of its notices on the Director of the United States Patent and Trademark Office and the Clerk of the United States Court of Appeals for the Federal Circuit. (*See* ECF No. 1 at 3). CF CRESPE appeals from the Decision and from all orders, decisions, rulings and opinions underlying that Decision. (*See Id.* at 3-4).

STATEMENT OF ISSUES

1. Whether the Board erred in finding that the combination of EP 0 696 854 ("Thomson"), Harris,[1] and U.S. Patent No. 5,381,357 ("Grumman") rendered claim 11 obvious under 35 U.S.C. § 103(a), where Grumman failed to disclose a plurality of FIR filters or a single signal processor as required by Claim 11.

2. Whether the Board erred in finding that the combination of Thomson, Harris and Grumman rendered claim 12 obvious under 35 U.S.C. § 103(a), where there was no adequate motivation to combine the references.

3. Whether the Board erred in finding that the combination of Thomson, Harris and U.S. Patent No. 6,377,316 ("Zenith") rendered claims 13 obvious under 35 U.S.C. § 103(a), where the Board previously declined to institute review on that claim in view of the combination of Thomson and Harris, and the addition of Zenith does not disclose all of the limitations of the challenged claim.

4. Whether the Board erred in finding that the combination of Thomson Harris and Zenith rendered claims 15 and 20 obvious under 35 U.S.C. § 103(a), where Zenith disclosed a circuit that detected the presence or absence of analog-

[1] Harris refers to the publication cited by the Board as Clay Olmstead and Mike Petrowski, *A Digital Tuner for Wideband Receivers*, DSP Applications Magazine (Sept. 1992).

type sync signals, rather than the identification of a signal format by the detection of carrier signals as required by the claims.

5. Whether the Board erred in finding that the combination of Thomson, Harris, Zenith and U.S. Patent No. 6,725,463 ("Birleson") rendered claim 14 obvious under 35 U.S.C. § 103(a), where the Board relied on its erroneous finding with respect to claim 13 on which it depends.

STATEMENT OF THE CASE

I. CF CRESPE LLC

CF CRESPE is the successor in interest of Cresta Technology Corporation ("Cresta"), formerly a technology start-up based in Santa Clara, California. Cresta was founded in 2005 and was an innovator in programmable broadband television reception for personal computers. Appx101-102.

In 2011, Cresta expanded its technology portfolio, its suite of products, and its engineering staff by acquiring the assets of Xceive Corporation ("Xceive"). *Id.* Xceive was another Silicon Valley company that developed fully integrated, multi-standard, RF-to-baseband receivers for television sets and set top boxes. *Id*. In the acquisition, Cresta acquired all right title and interest in the '585 Patent. *See id*.

During the pendency of the '615 IPR, Cresta filed for Chapter 7 bankruptcy protection. *See* Appx2455. CF CRESPE acquired all right, title and interest in the '585 Patent by assignment from Cresta's bankruptcy trustee.

II. TECHNOLOGY OF THE '585 PATENT

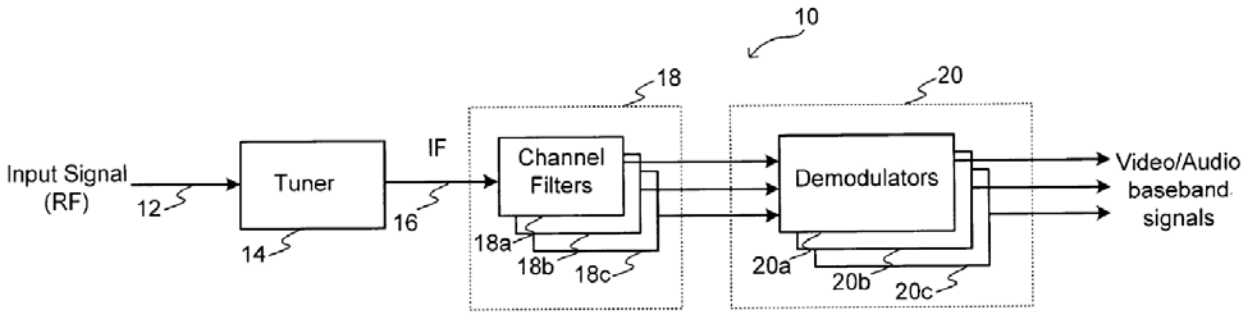
The '585 Patent relates to multi-standard television signal receivers for receiving television signals encoded in accordance with a variety of analog and digital television standards.

Television signals in different countries frequently operate according to different standards. Appx73, col. 1 ll. 27-30. An analog signal may be transmitted

according to, for example, the National Television Standards Committee (NTSC) standard and digital signals may be transmitted according to the Digital Video Broadcast (DVB) standards. *Id.*, col. 1 ll. 34-37.

Traditionally, television receivers were manufactured specifically for the analog or digital standards used in a particular geographic area. *Id.*, col. 1 ll. 37-39. The inability of most televisions to receive and decode signals from multiple standards effectively restricted the sale and use of those televisions to the countries or regions having the compatible standard. *Id.*, col. 1 ll. 39-42.

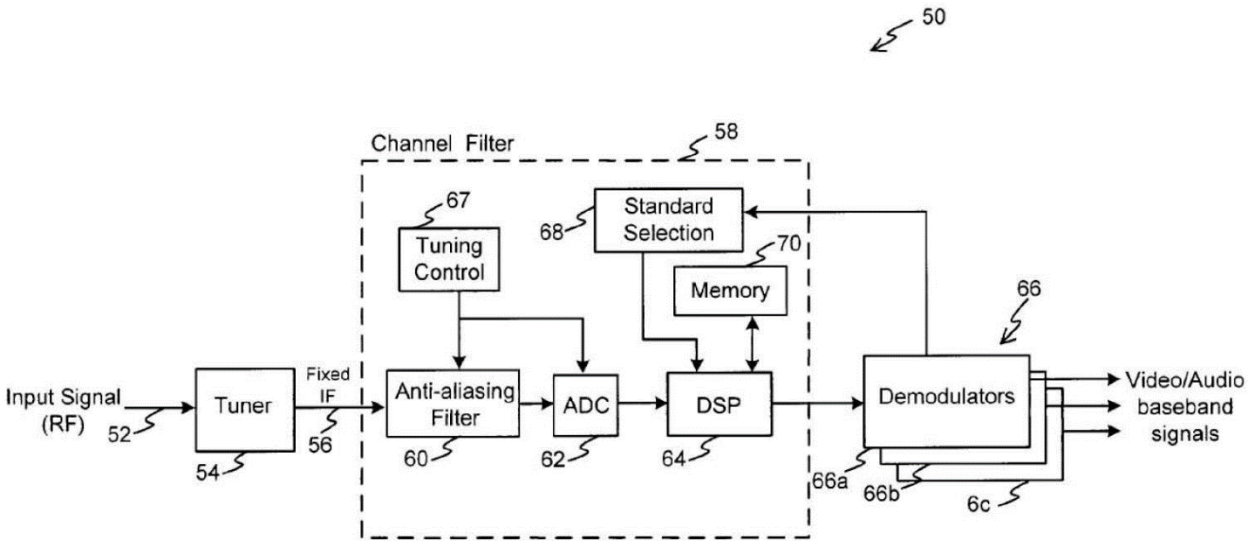
Televisions capable of receiving signals in multiple standards typically did so by duplicating the hardware necessary for decoding each standard. *Id.*, col. 1 ll. 43-47. One such system is reproduced in Figure 1 of the '585 Patent, shown below. Appx68, FIG. 1.



This system required a tuner (14), which received an input radio frequency (RF) signal and converted the input RF signal to an intermediate frequency (IF). Appx73, col. 1 ll. 48-57. Once converted, the IF is received by a bank of channel filters (18) each of which was typically a discrete filter designed specifically for

one particular television standard. *Id.*, col. 2 ll. 1-8. Each channel filter would be matched with a demodulator (20a – 20c), which received the filtered signals and output video and audio signals in the form of either an MPEG data stream, for digital signals, or a Composite Video Baseband Signal (CVBS) and related audio outputs, for analog signals. *Id.*, col. 2 ll. 12-26. These solutions have several drawbacks, as the required duplication of components increases both the size of the receiver, and its cost of manufacture. *Id.*, col. 2 ll. 27-35. The '585 Patent addresses these problems by providing multi-standard, dual-format television receivers that are both high-performance and cost-effective. *Id.*, col 2 ll. 36-39.

The '585 Patent discloses a "broadband television signal receiver for receiving multi-standard analog television signals, digital television signals and data channels." Appx73, col. 1 ll. 16-19. One example of the patented receiver is represented in Figure 2 of the '585 Patent:



Appx69, FIG 2. The television receiver (50) receives input RF signals, such as those received on an antenna or on a cable line, on an input terminal (52). Appx74, col. 3 ll. 46-48. The input RF signals are received by a tuner (54) which converts the input RF signal to an intermediate signal having an intermediate frequency (IF). *Id.*, col. 3 ll. 48-56. The IF signal from the tuner is then received by the multi-standard channel filter (58). *Id.*, col. 4 ll. 3-5. The channel filter includes an anti-aliasing filter (60), an analog-to-digital converter (ADC) (62) and a digital signal processor (DSP) (64). *Id.*, col. 4 ll. 5-9. The anti-aliasing filter performs pre-processing on the IF signal to prevent aliasing during sampling and digitization by the ADC. *Id.*, col. 4 ll. 17-20. The ADC in turn, samples the IF signal and creates a digital representation thereof. *Id.*, col. 4 ll. 25-30.

After filtering and digitization, the digital signal is processed by the DSP according to the television standard in which the input RF signal is encoded. *Id.*,

col. 4 ll. 51-54. In one embodiment the receiver uses a channel selection circuit (68) for selecting between the several analog and digital television standards. *Id.*, col. 4 ll. 55-61. Based on the state of the channel selection circuit, the DSP may apply one of several filter functions stored in a look-up table in memory (70) to the incoming digital signal. *Id.*, col. 4 ll. 57-64. The outputs from the channel filter are coupled with a bank of demodulators (66) for generating the appropriate audio and video baseband signals. *Id.*, col. 5 ll. 43-47. In one example, the bank of demodulators includes a demodulator for analog television signals, for digital television signals, and for digital data channels. *Id.*, col. 5 ll. 49-51.

The '585 Patent has 21 claims, including independent claims 1 and 17. Claims 11-15 and 20 are at issue in this appeal. Claims 11-15 depend directly or indirectly from claim 10, which depends from claim 1. Claims 1 and 10 recite:

> 1. A receiver comprising:
> a tuner for receiving input RF signals and for converting said input RF signals to intermediate signals having an intermediate frequency (IF), said input RF signals encoding information in one of a plurality of formats; and
> a channel filter for receiving the intermediate signals, said channel filter comprising:
> an anti-aliasing filter for filtering said intermediate signals;
> an analog-to-digital converter for sampling said filtered intermediate signals and generating a digital representation thereof;
> a signal processor for processing said digital representation of said intermediate signals in

> accordance with said format of said input RF signal, said signal processor generating digital output signals indicative of information encoded in said input RF signal; and
>
> a plurality of demodulators, each coupled to receive output signals from said signal processor, each of said demodulators for demodulating said digital output signals according to one of said formats of said input RF signal, each of said demodulators generating video and audio baseband signals corresponding to said format of said input RF signal.
>
> 10. The receiver of claim 1, wherein said signal processor applies one of a plurality of finite impulse response filters to said digital representation of said intermediate signal, each of said plurality of finite impulse response corresponding to a format of said input RF signal.

Appx75-76, Claims 1, 10.

Claims 11 through 13 are dependent from claim 10. Claim 11 adds that "the plurality of finite impulse response filters are stored in memory, and said signal processor indexes said memory to retrieve one of said plurality of finite impulse response filters." Appx76, Claim 11. Claim 12 elaborates upon the signal processor, adding that it "comprises a first computing unit and a second computing unit, said first computing unit processing a real part of said finite impulse response filter operation while said second computing unit processing an imaginary part of said finite impulse response filter operation." *Id.*, Claim 12. Claim 13 modifies the channel filter of claim 1, so that it "comprises a standard selection circuit

coupled to said signal processor, said standard selection circuit generating a select signal indicative of a format of said input RF signal and said signal processor selecting a finite impulse response filter in response to said select signal." *Id.*, Claim 13.

Claims 14 and 15 depend from claim 13 and recite two variations on the standard selection circuit disclosed in claim 13. Claim 14 recites that the "standard selection circuit generates said select signal in response to an input from the user." *Id.*, Claim 14. Claim 15 requires the "standard selection circuit generates said select signal by detecting carrier signals identifying one of said formats of said input RF signals." *Id.*, Claim 15.

Claim 20 depends from claim 19, which depends from claim 17. Appx76. Claims 17 and 19 recite:

> 17. A method for receiving input RF signal comprising:
> receiving said input RF signals encoding information in one of a plurality of formats;
> converting said input RF signals to intermediate signals having an intermediate frequency;
> applying a first filter function to said intermediate signals, said first filter function being an anti-aliasing filter and having a center frequency;
> digitizing said filtered intermediate signals at a sampling frequency;
> processing said digitized signals in accordance with said format of said input RF signals and generating digital output signals indicative of information encoded in said input RF signals; and

> demodulating using a plurality of demodulators said processed digitized signals to generate baseband signals corresponding to said format of said input RF signals.
>
> 19. The method of claim 17, wherein said processing said digital signals is performed in response to a select signal indicative of said format of said input RF signal.

Appx76, Claims 17, 19.

Claim 20 requires "generating said select signal by detecting carrier signals in said input RF signal identifying said format of said input RF signal." *Id.*, Claim 20.

III. THE ASSERTED PRIOR ART

Silicon Laboratories Inc.'s ("Silicon") petition relies on the combination of either three or four references in support of each of its three grounds of alleged obviousness of the challenged claims of the '585 Patent. The five distinct references Silicon relied on are directed to a wide array of technical solutions in areas including satellite television, digital television receivers, and general electronics.

A. U.S. Patent No. 5,381,357 ("Grumman")

Grumman discloses a finite impulse response ("FIR") filter that filters complex signals by separating the real and imaginary parts of digital data into parallel digital paths. Appx232, col. 1 ll. 7-11. The complex data is processed using adaptive weights that are stored in two memory storage banks for access by

the filter or host processor. Appx233, col. 4 ll. 7-11. Processing is performed in two parallel processing circuits; a real and an imaginary processing circuit. Appx217, FIG. 2; Appx235, col. 7 ll. 32-35.

B. U.S. Patent No. 6,377,316 ("Zenith")[2]

Zenith discloses a television receiver that includes a tuner for receiving either analog or digital signals. Appx377, col. 1 ll. 7-10. The patent teaches a tuner that receives either analog or digital input and converts it to an IF signal. Appx377, col. 2 ll. 20-23. The signal may be directed through a switch connected to an A and D terminal. *Id.*, col. 2 ll. 59-61. Terminal A is connected to an analog demodulator, which supplies a sync separator. *Id.*, col. 2 ll. 29-36. The sync separator is capable of detecting the presence or absence of syncs corresponding to a demodulated analog type signal. *Id.*, col. 2 ll. 36-45. If a sync signal is detected, indicating that the signal is analog, the sync separator sends an indication to a microprocessor which causes the switch to connect to the analog terminal. *Id.*, col. 2 ll. 38-42. In the absence of a sync signal, the microprocessor causes the switch to connect to the digital terminal. *Id.*, col. 2 ll. 42-45.

[2] Grumman and Zenith were identified by their assignee, rather than by the inventor, in the proceedings before the Board. CF CRESPE maintains this nomenclature on for consistency.

C. U.S. Patent No. 6,725,463 ("Birleson")

Birleson discloses a dual mode turner and receiver for receiving and processing both analog and digital signals. Appx458, Abstract. The only portion of Birleson relied on in the petition is its disclosure of an automatic carrier detection circuit for determining whether the incoming channel is an analog signal or a digital signal. Appx471, col. 10 ll. 52-54. Birleson teaches that signal testing using the ACD may be automatic, or may be user-initiated. Appx472, col. 11 l. 34.

D. Thomson and Harris

The Board relied on the combination of Thomson, with or without Harris, to anticipate or render obvious claims 1, 10, 17 and 19, from which the claims challenged in the '615 IPR depend. *See* Appx2988; *Silicon Laboratories, Inc. v. Cresta Technology Corp.*, IPR2014-00728, 2015 WL 6441485, at *7-13 (P.T.A.B. Oct. 21, 2015) (Paper 53) (hereinafter the "'728 Decision"). The Board relied on the combination of Thomson and Harris in support of all grounds of alleged unpatentability in the '615 IPR. Appx2988.

Thomson discloses a satellite television receiver for processing satellite television signals. *See* Appx132, col. 1 ll. 29-33. The receiver of Thomson, accepts an IF_{SAT} signal which it further down-converts for processing within the receiver. Appx134, FIG. 1; Appx132, col. 1 l. 56 – col. 2 l. 1, col 2 ll. 30-33. The signal is fed to an analog-to-digital converter, followed by a bandpass filter that

selects the desired signal using an adaptively controlled bandwidth. Appx132, col. 2 ll. 34-39; Appx133, col. 3 ll. 16-19. The signal is then routed to an analog demodulator for demodulating analog baseband signals, or a digital demodulator to generate digital baseband signals. *See* Appx132, col 2 ll. 37-44; Appx133, col. 3 ll. 19-25.

The Board did not find that the bandpass filter in Thomson disclosed a finite impulse response filter required by claim 10. *See* '728 Decision, at*11-12. For that, the Board found that the bandpass filter in Thomson could be implemented using the digital decimation filter disclosed in Harris, and intended to be used in cellular telephones, mobile radios and wireless LANs. *Id.*; Appx138. While the Board did not find that the Harris DDF component could be substituted into the receiver of Thomson, it concluded that Harris provided an overall teaching of programmable, digital FIR filters to implement a channelized receiver. '728 Decision, at *11-12.

IV. PROCEDURAL HISTORY

A. The '728 Decision and Appeal

Claims 1, 10, 17 and 19 were previously subject to a challenge by Silicon Laboratories before the Board. '728 Decision, at *10-11. The Board in the '615 IPR adopted the claim constructions from the '728 Decision, as well as its prior

analysis in the '728 Decision with respect to claims 1, 10 and 17 and 19. Appx2982-2983, Appx2988.

The Board found claims 1-3, 5, 10 and 16-19 of the '585 Patent to be unpatentable under each of the grounds asserted by Silicon. '728 Decision, at *13. The Board's decision was affirmed without opinion by this Court on November 8, 2016. *Silicon Laboratories, Inc. v. Cresta Technology Corp.*, No. 16-1526, 2016 WL 6595988 (Fed. Cir. Nov. 8, 2016).

The Board declined to institute review with respect to two claims, 13 and 14, both of which are at issue in the present appeal. The Board rejected Silicon's contention that the combination of Thomson and Harris inherently disclosed a standard selection circuit required by claim 13, or that Thomson, Harris and a third reference inherently disclosed that the standard selection circuit detected a television standard based on the format of the received television signal. *Silicon Laboratories, Inc. v. Cresta Technology Corp.*, IPR2014-00728, 2014 WL 5465311, at *9-11 (P.T.A.B. Oct. 24, 2014) (Paper 9). The Board found that neither Silicon, nor its expert Dr. Holberg, provided sufficient explanation for "why a 'standard selection circuit' must necessarily be included in the structure of Thomson." *Id.* at *9.

B. The ’615 IPR

After having failed to persuade the Board to institute *inter partes* review of claims 13 and 14 over the combination of Thomson and Harris, Silicon expanded their challenge to include additional prior art references. It sought to re-challenge claims 13 and 14, as well as claims 11-12, 15 and 20, under combinations of either three or four references, including those already adjudicated in its previous IPR proceeding.

The Board instituted review of the ’585 Patent on three grounds, as shown in the table below:

Reference(s)	Basis	Claim(s) Challenged
Thomson, Harris and Grumman	§ 103(a)	11 and 12
Thomson, Harris and Zenith	§ 103(a)	13, 15 and 20
Thomson, Harris, Zenith and Birleson	§ 103(a)	14

Appx2987.

The Board construed two additional claim terms that had not been at issue in the ’728 Decision. It construed “select signal,” appearing in claim 13, to mean a signal that serves as a sign of a format of the input RF signal. Appx2985-2986. It construed “carrier signal,” in claims 15 and 20, to have its plain and ordinary meaning based on a dictionary definition that stated a carrier wave “is a wave having at least one characteristic that may be varied from a known reference value by modulation.” Appx2986.

The Board found claims 11-15 and 20 of the ’585 Patent to be unpatentable under each of the grounds asserted by Silicon.

SUMMARY OF THE ARGUMENT

The Board erred in determining that claims 11-15 and 20 of the '585 Patent were obvious over the prior art. The Board's findings with respect to each of the three grounds were not supported by substantial evidence.

Claim 11 is patentable over the combination of Thomson, Harris and Grumman as set forth in Ground 1 of the Petition. While the petition argued that Grumman disclosed a plurality of FIR filters as required by the claims, Patent Owner argued, and the Board did not dispute that Grumman only discloses a single FIR filter. The Board erred by concluding that this limitation was met even though substantial evidence did not support this finding.

The Board also erred because Grumman fails to disclose a signal processor "indexes said memory to retrieve one of said plurality of finite impulse response filters." The Patent Owner argued, and the Board did not disagree, that Grumman did not disclose a single signal processor as required by the claims. The Board erred by relying on disclosures in Thomson and Harris for this limitation, in a manner that would have rendered the FIR filter in Grumman inoperable.

The Board erred in finding a motivation to combine Thomson, Harris and Grumman. A general statement of efficiency without any support in the references is inadequate to explain why a person of ordinary skill in the art would have incorporated the significantly more complex FIR filter disclosed in Grumman.

The Board's determination that the combination of Thomson, Harris and Zenith rendered claim 13 obvious should be reversed for lack of substantial evidence. The Board previously declined to institute review of claim 13 in view of the combination of Thomson and Harris because neither reference disclosed a standard selection circuit. The addition of Zenith does not teach the selection of a finite impulse response filter in response to a select signal. The Board erred in finding that combined references disclosed a limitation of claim 13 that none of the references disclosed individually.

Additionally, because claim 14 is dependent upon claim 13, the Board erred in finding claim 14 obvious over the combination of Thomson, Harris, Zenith and Birleson under Ground 3 for the same reasons as set forth above.

Finally, the Board erred in finding claims 15 and 20 obvious over the combination of Thomson, Harris and Zenith under Ground 2 because the combination fails to disclose detecting a carrier signal in the manner required by the claims. The sync signal disclosed in Zenith merely detects the presence or absence of one type signal format, and is not sufficient to read on the claims. Further, claim 15, which depends from claim 13, is not obvious for the reasons set forth with respect to claim 13.

For the reasons set forth above, each of the Board's findings with respect to claims 11-15 and 20 are not supported by substantial evidence. The final written decision of the Board should be reversed with respect to all claims.

ARGUMENT

I. LEGAL STANDARDS AND STANDARD OF REVIEW

The Court reviews the Board's factual findings for substantial evidence and reviews the Board's legal conclusions de novo. *In re Baxter Int'l, Inc.*, 678 F.3d 1357, 1361 (Fed.Cir.2012). The ultimate determination of invalidity under section 103 is a question of law based on underlying factual findings. *Id.* (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966)). The determination of what a reference teaches is a question of fact. *Baxter*, 678 F.3d at 1361 (citing *Rapoport v. Dement*, 254 F.3d 1053, 1063 (Fed. Cir. 2001)).

II. CLAIMS 11-15 AND 20 ARE PATENTABLE OVER THE PRIOR ART

A. The Board's Interpretation of Grumman with Respect to Claim 11 is Not Supported by Substantial Evidence

Claim 11 is dependent upon claim 10, and requires the additional limitation "wherein said plurality of finite impulse response filters are stored in a memory, and said signal processor indexes said memory to retrieve one of said plurality of finite impulse response filters." Appx76, Claim 11. Neither Grumman, nor the combination of references as a whole, disclose storing a plurality of FIR filters in memory. The Board interpreted the FIR filters disclosed in Grumman in a manner that is at odds with Silicon's own arguments set forth in the Petition. Additionally, Silicon failed to show how the parallel processing circuits in Grumman disclose

the signal processor limitation of claim 11, or otherwise could be combined with the signal processor allegedly disclosed in Thomson or Harris. The Board's determination with respect to Claim 11 was not supported by substantial evidence.

1. *Grumman Does Not Disclose Storing a Plurality of FIR Filters in Memory*

The petition relies on Grumman as disclosing a plurality of FIR filters that are stored in memory. Appx48-49. However, Grumman actually discloses a single FIR filter having real and imaginary components, wherein the components are stored in memory. No reference in the combination of references discloses storing a plurality of FIR filters in memory where they can be indexed and retrieved by a signal processor. *See* Appx76, Claim 11.

Grumman teaches that the separate coefficients are not the FIR filter, but are components of a single FIR filter broken down into their real and imaginary data parts. *See* Appx233, col. 4 ll. 7-9 ("The coefficient data values of the adaptive weight circuits are stored in two memory storage banks for access by ***the*** filter or host processor."); *id.*, col. 3 ll. 31-34 ("The present invention is directed to a complex Finite-Impulse-Response filter with adaptive weights for processing complex digital data having real and imaginary input data portions."). This is consistent with the '585 Patent, which considers the real and imaginary parts to be two components of a single FIR filter. Appx76, Claim 12.

Because the '585 Patent regards the real and imaginary data portions of a FIR filter to be components of a single filter, Grumman does not disclose the limitations of claim 11. Data portions of a single filter are disclosed as being stored in memory, not the FIR filter itself. This is relevant because Grumman also discloses parallel signal processing pathways that index and retrieve the *stored components* of the FIR filter, and not a filter of a plurality of filters. *See* Appx236, col. 10 l. 65 – col. 11 l. 11. No reference in the combination of Thomson, Harris and Grumman discloses storing and retrieving the FIR filters themselves in memory.

The mere fact that Grumman discloses storing data in memory and retrieving it does not add to the alleged obviousness combination where the data being stored and retrieved is not the claimed data. Claim 11 requires a plurality of FIR filters stored in memory, which is not taught or suggested by Silicon's proposed combination.

Silicon recognized that the combination of Grumman with Thomson and Harris would necessarily require that Grumman store a plurality of FIR filters in memory. It argued that Grumman disclosed "the storage of two sets of coefficients, each set corresponding to a separate FIR filter." Appx48. It further represented that "[b]ecause Grumman discloses storing coefficients for two FIR filters in memory, one set of coefficients for one FIR filter stored in bank 0 and

another set of coefficients for another FIR filter stored in bank 1, this limitation is met by Grumman." Appx49-50. Thus, Silicon recognized that Grumman's relevance to the combination depended on it disclosing multiple FIR filters. The Board did not dispute that Grumman disclosed only a single FIR filter. Instead, the Board found that Grumman modified Harris "so that Harris's FIR filters store sets of FIR filter coefficients in memory and so that Harris's signal processor indexes those coefficients for retrieval." Appx2990. Silicon did not present this argument in the Petition. *See* Appx48-50.

"It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify 'with particularity' the 'evidence that supports the grounds for the challenge to each claim.'" *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3)). Silicon's petition alleged that Grumman taught storing a plurality of FIR filter in memory, as required by the claims. That was the only theory presented by Silicon in which the combination of Thomson, Harris and Grumman rendered claim 11 obvious. Thus, no evidence in the petition supported the Board's conclusion that the combination could render claim 11 obvious even where Grumman disclosed only one FIR filter, and therefore no reference disclosed storing FIR filters in memory. The Board's conclusion is unsupported by the petition and unsupported by substantial evidence.

Silicon raised, for the first time in its Reply, the argument that Grumman would still read on the limitation in claim 11 even if it only disclosed a single FIR filter. Appx2649. Such an argument, presented only in Silicon's reply, should not have been considered by the Board. Office Patent Trial Practice Guide, Part II.I, 77 Fed. Reg. 48756, 48767 (Aug. 14, 2012) ("[A] reply that raises a new issue or belatedly presents evidence will not be considered and may be returned."). Nevertheless, Silicon's argument was inapposite. Silicon asserted that Grumman was intended to modify the adaptive filter disclosed in Thomson, not the FIR filter disclosed in Harris as the Board found. Appx2649; Appx2990-2991.

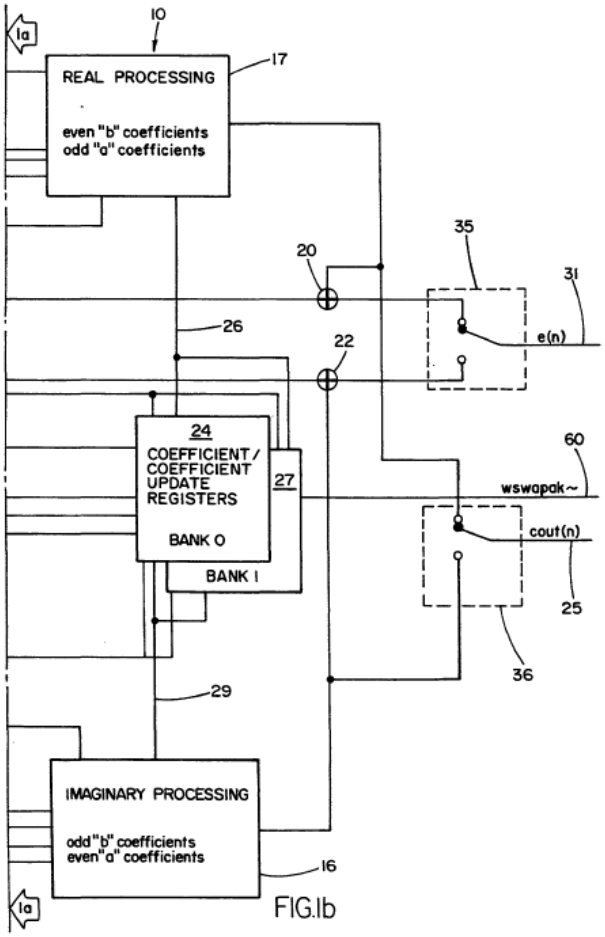
The combination of Thomson, Harris and Grumman does not read on the added limitations of claim 11 because Grumman does not disclose storing a plurality of FIR filters in memory. The Board erred in finding against the arguments presented by Silicon in the Petition. *Intelligent Bio-Sys.*, 821 F.3d at 1369 ("Unlike district court litigation . . .the expedited nature of IPRs bring with it an obligation for petitioners to make their case in their petition to institute."). The reinvented combination proposed by the Board does not read on the limitations of claim 11, and is conclusions are not supported by substantial evidence.

2. *Grumman's Multiple Signal Processing Pathways Do Not Read on the Single Signal Processor Required by Claim 11*

Claim 11 also requires that the "signal processor" of claim 1 "indexes said memory to retrieve one of said plurality of finite impulse response filters."

Appx76, Claim 11. Grumman discloses parallel signal processor circuits, not a single signal processor. *See* Appx216, FIG. 1b (disclosing imaginary processor 16 and real processor 17 in parallel circuitry). The Board did not address this deficiency in Grumman. Instead, it found that Thomson, modified by Harris, discloses the claimed processor. The Board's findings are inconsistent with the arguments in the Petition and not supported by substantial evidence. *Intelligent Bio-Sys.*, 821 F.3d at 1369.

Grumman discloses two processing units, 16 and 17 in the figure to the right, that work in tandem to process the complex data in memory banks 0 and 1. Appx216, FIG. 1b. Grumman describes its filter as "having two sets of parallel paths: one for processing the real data portion of the input signal and the other set for processing the imaginary portion of the input signal." Appx233, col. 4 ll. 34-38



Grumman, FIG. 1b

(describing FIG 2). This description is supported by the declaration of Dr. Opris, who explained that Grumman teaches a parallel workflow involving separate processing components to process the real and imaginary data of the FIR filter, rather than a single signal processor. Appx2049 ¶ 100.

The Board's Decision ignored this issue by finding that the signal processor limitation is introduced in claim 1, which had been found to be obvious over Thomson. The Board did not dispute that the multiple signal processors disclosed in Grumman do not read on the signal processor in claim 11. The Board's decision contradicts the evidence presented by Silicon in the petition, which relies on Grumman, and not Thomson or Harris, for the signal processor of claim 11. *See* Appx50 ("Grumman discloses a signal processor that indexes memory to retrieve FIR filter coefficients . . . ."); Appx51 ("A person of ordinary skill in the art would have been motivated to implement the FIR filter of Harris using the Grumman architecture.").

As set forth above, *supra* Argument Part II.A.1, where the evidence presented in the petition argues in favor only one theory of invalidity, the Board should not find against that theory and make a finding of invalidity that is not supported by substantial evidence. *Intelligent Bio-Sys.*, 821 F.3d at 1369. It is not enough to find that Grumman taught signal processing if the parallel signal processors disclosed in Grumman would not be compatible with the claims

requirement for a single signal processor. The disclosures in Grumman would teach away from a single signal processor that could index memory to retrieve one of a plurality of FIR filters.

The Board erred in finding that the addition of Grumman necessarily "builds upon" the grounds of invalidity with respect to claims 10 and 11. The combination of Thomson, Harris and Grumman cannot simultaneously read on both claims 10 and 11 because of the differences in architecture required to implement Grumman in the combination alleged to render claim 11 obvious. Claim 1 and Claim 10 require that the receiver have a single signal processor. Appx75-76, Claims 1, 10. The bandpass filter of Thomson, as implemented by Harris, is alleged to meet this limitation. *See* Appx44-45. Even if the signal processor limitation of claim 1 or claim 10 were allegedly met by Thomson or Thomson and Harris, which it is not, there is no support for the Board's finding that the FIR filter in Harris could be implemented with the architecture in Grumman. Grumman requires at least two parallel signal processors, rather than one. Modifying Thomson and Harris with the architecture in Grumman would take the combination outside of the scope of claims 1 and 10, which means it could not read on claim 11. Grumman requires multiple components to perform the actions that claims 1 and 10 require only one component to perform. *See In re Urbanski*, 809 F.3d 1237, 1244 (Fed Cir. 2016) (It would not be obvious to combine references where the combination would have

been "inoperable for its intended purpose."); *Enzo Biochem, Inc. v. Applera Corp.*, 599 F.3d 1325, 1334 (Fed. Cir. 2010) ("A person of ordinary skill in the art would presume that a structure recited in a dependent claim will perform a function required of that structure in an independent claim."). Because the combination of Thomson, Harris and Grumman cannot simultaneously read on both claims 10 and 11, the combination would not have been obvious to one of ordinary skill in the art.

The Board's determination that Grumman need not disclose the signal processor of claim 11 is not supported by Silicon's Petition or substantial evidence. The Board erred in finding that claim 11 was obvious over the combination of Thomson, Harris and Grumman.

B. The Board Erred in Finding a Motivation to Combine Thomson, Harris and Grumman

The Board erred in finding that Silicon had demonstrated an adequate motivation to combine Thomson, Harris and Grumman. The Board's determination that "efficiency" supported Silicon's motivation to combine references does not explain how or why the teachings of the specific references would be combined, and is not supported by substantial evidence.

Silicon failed to explain "how [and] why the teachings of the specific references would have been combined by a skilled artisan, which combination of elements in specific references would yield a predictable result, [and] how any specific combination would operate or read on the asserted claims and render those

claims obvious." *TRW Automotive US LLC v. Magna Electronics Inc.*, IPR2014-00869, slip op. at 24-26 (PTAB Dec. 1, 2014) (Paper 8) (citing *ActiveVideo Networks v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012)). Merely identifying a disclosure in the asserted reference and stating that it would be more efficient is not enough. *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (an obviousness challenge "cannot be sustained on mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.").

Silicon contends that a person of ordinary skill in the art would have been motivated to combine Grumman with Thomson because Grumman's adaptive FIR filter architecture is very efficient. Appx54. However, the petition relies on Harris, not Thomson, to supply the plurality of FIR filters required by claim 10, from which claim 12 depends. Appx47. A mere appeal to efficiency is not sufficient to explain why or how a person of ordinary skill in the art would modify a component in Thomson that was already modified by Harris.

A statement that a proposed modification would be efficient is not enough to explain *why* a skilled artisan would have been concerned with increasing the efficiency of a device in Thomson that the skilled artisan had already theoretically modified with the teachings of Harris. *Power-One, Inc. v. Artesyn Techs., Inc.*, 599 F.3d 1343, 1352 (Fed. Cir. 2010) (Petitioner must provide a "plausible

rationale as to why the prior art references would have worked together" to render the claims of the patent obvious."); *see also DyStar Textilfarben GmbH & Co. v. C.H. Patrick Co.*, 464 F.3d 1356, 1366-67 (Fed. Cir. 2006) (Board "must explain *why* 'common sense' of an ordinary artisan seeking to solve the problem at hand would have led him to combine the references.").

A motivation to combine requires more than an allegation that a reference would "benefit[] from the advantages" of one more modifications. *In re Schweickert*, No. 2016-1266, 2017 WL 371374, at *5 (Fed. Cir. Jan. 26, 2017). Where the base reference functions without trouble, and the modifications would add additional cost or complexity to the system, the Petitioner must do more to explain why the proposed addition or modification would not be unwanted and unnecessary. *Id*. at *4.

Here, there is no suggestion that efficiency of the proposed combination of Thomson and Harris was a problem that needed to be addressed by additional modifications. Furthermore, there is no teaching in the art to suggest why efficiency would have lead a skilled artisan to identify this specific solution, as opposed to others which also may have been efficient. A naked appeal to efficiency, without more, does not add to the proposed modification to combine than a naked appeal to intuition or common sense, which the Board is not permitted to indulge. *In re Van Os*, 844 F.3d 1359, 1361 (Fed. Cir. 2017).

As Patent Owner's expert, Dr. Opris, explained, both Thomson and Harris disclose only real filters, not complex filters containing both real and imaginary data, such as the one disclosed by Grumman. Appx2052 ¶ 107. The efficiency purportedly recited by Grumman of its own system does not explain why a person of ordinary skill in the art would modify a real filter to become a complex filter that includes both real and imaginary data. *Id.* The added complexity of Grumman would reasonably outweigh any potential gains in efficiency that would come by implementing Grumman's complex data filter. *Kahn*, 441 F.3d at 988.

Silicon's purported motivation to combine fails to explain how or why a person of ordinary skill in the art would modify the combination of Thomson and Harris to include the FIR filter disclosed in Grumman. Thus, the Board's decision is not supported by substantial evidence.

C. Claim 13 is Not Obvious Because the Combination of Thomson, Harris and Zenith Does Not Teach the Selection of a Finite Impulse Response Filter in Response to a Select Signal

The Board erred in finding that the combination of Thomson, Harris and Zenith disclosed all the limitations of claim 13. Zenith cannot be combined with the teachings of Thomson and Harris to teach the selection of a finite impulse response filter in response to a select signal.

Claim 13 depends from claim 10 and requires:

> wherein said channel filter further comprises a standard selection circuit coupled to said signal processor, said

> standard selection circuit generating a select signal indicative of a format of said input RF signal and said signal processor selecting a finite impulse response filter in response to said select signal.

Appx76, Claim 13.

The teachings of Zenith are incompatible with, and add nothing to, the combination of Thomson and Harris. The Board previously declined to institute *inter partes* review on claim 13 in view of the combination of Thomson and Harris. *Silicon Laboratories, Inc. v. Cresta Technology Corp.*, IPR2014-00728, 2014 WL 5465311, at *9-11 (P.T.A.B. Oct. 24, 2014) (Paper 9). The Board found that Silicon and its expert, Dr. Holberg failed to show "why a 'standard selection circuit' must necessarily be included in the structure of Thomson." *Id.* at *9. Indeed, Dr. Opris explained that a standard selection circuit would not be required in the combination of Thomson and Harris. Appx2042-2045, ¶¶ 79-88. In Dr. Opris's opinion, both the digital and analog demodulators of Thomson are simultaneously active. Appx2044, ¶ 84. Harris teaches a plurality of finite impulse response filters that are simultaneously active. *Id.* Thus, there would be no need to perform standard selection "because multiple formats are processed in parallel." *Id.*

In view of the Board's findings with respect to Thomson and Harris, the combination fails to disclose "selecting a finite impulse response filter in response to said select signal" as required by claim 13. Appx76, Claim 13. Because neither

Thomson nor Harris disclose a standard selection circuit generating a select signal, neither reference may disclose selecting a FIR filter in response to such a signal. Appx76, Claim 13. Zenith teaches selecting between ***one of two demodulators*** based on the presence or absence of a sync signal corresponding to a demodulated analog type signal, and not the selection of an FIR filter. Appx375, FIGs. 1, 2; Appx377 col. 2 ll. 33-44, col. 3 ll. 13-15.

The Board did not dispute Patent Owner's contention that "none of the references, taken individually disclose the selection of an FIR filter. . . ." Appx3004. However, the Board errs by concluding, without legal support, that the references taken together can teach what none of them teach apart. *Id.* A combination of references is not greater than the sum of its parts. Rather, if the challenged claim is more than the sum of asserted prior art references, it is nonobvious. *Am. Med. Sys., Inc. v. Biolitec, Inc.*, 774 F. Supp. 2d 375, 384 (D. Mass. 2011) (A patent which is "more than a sum of the parts of the two prior patents" is nonobvious); *See also Great Atl. & Pac. Tea Co. v. Supermarket Equip. Corp.*, 340 U.S. 147, 152 (1950) ("The conjunction or concert of known elements must contribute something; only when the whole in some way exceeds the sum of its parts is the accumulation of old devices patentable.").

The addition of Zenith should not overcome the Board's earlier decision not to institute review of claim 13 in view of Thomson and Harris. What the Board

found to be not disclosed in Thomson and Harris, Zenith does not adequately replace. Substantial evidence does not support the Board's conclusion that the combination of references can teach what each separate reference does not.

D. Claim 14 Depends from Claim 13 and Is Not Obvious for The Same Reason as Claim 13

Because the Board erred in finding that the combination of Thomson, Harris and Zenith rendered claim 13 obvious, claim 14, which depends from claim 13, is also not obvious.

Claim 14 recites the "[t]he receiver of claim 13, wherein said standard selection circuit generates said select signal in response to an input signal from a user." Appx76, Claim 14. The Board and Silicon relied solely on Zenith for the limitations added by Claim 13. Because the Board erred in finding that claim 13 was obvious over the combination of Thomson, Harris and Zenith, *see supra* Argument Part II.C, its determination with respect to Claim 14 was not supported by substantial evidence.

E. The Board Erred in Finding that Zenith Disclosed Detecting a Carrier Signal as Required by Claims 15 and 20

Both claims 15 and 20 require the generation of a select signal by detecting carrier signals. Claim 15 depends from claim 13, which recites the channel filter of claim 1, further comprising "a standard selection circuit generating a select signal indicative of the format" of the input RF signal, and "said signal processor

selecting a finite impulse response filter" in response to the select signal. Appx76, Claim 13. Claim 15 adds the further limitation:

> wherein said standard selection circuit generates said select signal by detecting carrier signals identifying one of said formats of said input RF signals.

Appx76, Claim 15.

Claim 20 depends from claim 19, which adds to the method of claim 17 wherein "the processing of said digital signals is performed in response to a select signal indicative of" the format of the input RF signal. *Id.*, Claim 19. Claim 20 further comprises:

> generating said select signal by detecting carrier signals in said input RF signal identifying said format of said input RF signal.

The '585 Patent explains that the selection of the correct television standard can be made automatically by detecting in the baseband signals carrier signals that uniquely identify the format of the signal. Appx75, col. 5 ll. 7-15. For example, "analog television signals can be identified by the analog visual carrier signal while digital television signals can be identified by the pilot carrier." *Id.* Col. 5 ll. 15-18.

The Board found that Zenith disclosed this limitation via the sync separator, labeled SYNC DET in the figures. Appx375-376, FIGs. 1-3; Appx377, col. 2 ll. 34-38.

Claim 15 is not obvious over the combination of Thomson, Harris and Zenith for the same reasons that claim 13, from which it depends, is not obvious. Additionally, the Sync separator disclosed in Zenith is too rudimentary to read on the limitation of claims 15 and 20. Zenith teaches that the separator is supplied solely by the analog demodulator and merely detects the presence of sync signals if the signal is analog, or the absence of sync signals if it is digital. Appx377, col. 2 ll. 38-45. Claims 15 and 20 require more than the detection of the presence or absence of an analog signal. They require affirmatively detecting a carrier signal whether it is analog or digital. *See* Appx75, col. 5 ll. 7-15. This is important because the receiver of the '585 Patent was not intended to be limited to an either-or choice of analog or digital television signals. In a preferred embodiment, the receiver contains at least three demodulators for demodulating analog television signals, digital television signals, and digital data channels. Appx75, col. 5 ll. 53-57. A prior art sync separator would be unable to distinguish between different forms of digital signals, and thus would not be capable of identifying the format of all input RF signals.

The absence of a signal is not a signal. The claims require not only the generation of a select signal, but one which is always generated *by detecting* a signal. Appx76, Claims 15, 20. Because Zenith relies on the absence of a signal, it would not read on the required claim limitations.

The sync separator of Zenith is not capable of detecting carrier signals as claimed in claims 15 and 20 of the ’585 Patent. The Board’s finding to the contrary was not supported by substantial evidence.

CONCLUSION

For the reasons state above, the judgment of the Patent Trial and Appeal Board should be **REVERSED** with respect to claims 11-15 and 20 of the '585 Patent. The challenged claims are valid over the prior art asserted by Silicon in *inter partes* review no. IPR2014-00615.

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CERTIFICATE OF COMPLIANCE WITH FED. R. CIV. P. 32(E)(7)(B)

The undersigned, Counsel of Record for Defendant-Appellee AllPure Technologies, Inc., hereby certifies that this ***Brief of Appellant CF CRESPE LLC*** complies with the type-volume limitation provided in Rule 32(e)(7)(B) of the Federal Rules of Appellate Procedure. In preparing this Certificate, I relied on the word-count function of Microsoft Word 2007. This Brief contains 7,833 words.

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CERTIFICATE OF SERVICE

I hereby certify that on February 13, 2017, I caused the foregoing ***Brief of Appellant CF CRESPE LLC*** to be electronically filed with the Clerk of the Court using the CM/ECF system which will send electronic notification of such filing to the following persons:

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